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## **DOD FY07 Annual Report-Continuation**

Performance Period: March 11, 2009-July 31, 2009

Report date: November 3, 2009

### **TASK 3: DARLENE A. DARTT, PH.D., JAMES D. ZIESKE, PH.D.**

Determine whether a corneal wound mimicking photorefractive keratectomy (PRK) in the setting of dry eye: (1) increases development of corneal haze indicating an increase in the corneal healing response, (2) exacerbates the dry eye, and (3) induces conjunctival stress compared to normal to prevent battlefield complications of refractive surgery

#### **BODY:**

The postdoctoral fellow working on this project arrived on March 2, 2009. He had postponed his arrival due to a serious illness that has now resolved. The fellow learned to wound the mouse corneal epithelium and remove conjunctiva for analysis. Unfortunately this postdoctoral fellow was accepted to medical school and left before starting on the project. We are currently negotiating with a new applicant for this position who we hope will start in January 2010.

We have changed the type of mouse to be used for study of dry eye in response to reviewers suggestions of the grant proposal and will now use Thrombospondin1 knock out mice. These mice develop autoimmune disease of the lacrimal gland that alters the tear film causing epithelial damage, decreased tear protein content, and increased tear fluid. We will breed the mice at the institute animal facility and have obtaining an animal protocol for this as well as for wounding the mice and removing conjunctiva.

We have also changed the measurement of conjunctival stress. We will now measure conjunctival cytokines. In a Department of Defense study of changes in cytokine production in tears before and after LASIK surgery we found that interleukin (IL)-1 $\beta$ , IL-6, IL-15, and tissue inhibitor of metalloproteinase (TIMP) were associated with the development of dry eye after refractive surgery. Thus we will measure these and other cytokines in the mouse conjunctiva before and after wounding and determine if dry eye alters the production of these cytokines. The Luminex will be used to measure multiple cytokines on the same sample. ELISA will also be used.

#### **KEY RESEARCH ACCOMPLISHMENTS:**

None as yet.

#### **REPORTABLE OUTCOMES:**

None as yet.

#### **CONSLUSION:**

None as yet.